

ELIMINATION OF EMPTY OR BLIND CONIFEROUS SEED BY
SPECIFIC GRAVITY SEPARATION:

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The removal of empty or blind seed in the processing of large lots of coniferous seed is an old problem, mainly because such seed are difficult to distinguish from those that are sound or full. As a consequence, they are not classed as impurities in the seed lots. However, their removal is common practice in processing most agricultural seed. One method employs a specific gravity-separator, commonly called a gravity table. This note presents a short report on the application and results of such separation with a lot of loblolly pine (*Pinus taeda* L.) seed.

A 440 pound lot of dewinged and cleaned seed collected on the Northeast Mississippi Experimental Forest in 1957, and averaging 65.8 percent sound seed, was passed over a gravity table employing a wire deck. Welch³ describes this separator. Essentially the seed pass over an inclined reciprocating deck where two motions shake them up and down and back and forth. Air passing through the deck floats the seed so that they become stratified with the heavier seed on the bottom. These seed move up an incline and thus are separated. Seed were collected at six different positions as they passed off the deck. These seed separates were then dried to 7 percent moisture content, and samples of each separate taken before the lot was placed in storage.

The results of cutting tests conducted on 100-seed samples from each of the gravity table separates and replicated six times are reported as follows:

Gravity table separate: ^{1/}	<u>Sound seed</u> <u>(number)</u>
1	100.0
2	99.7
3	96.2
4	84.5
5	35.7
6	0.0

^{1/} L.S.D. to compare separate means at the 0.05 and 0.01 levels are 4.5 and 6.1 respectively.

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3 Welch, G. B. Seed processing equipment. Miss. Agr. Expt. Sta. Bul. 520, 22 pp., 1954.

These data show the effectiveness of the process as a means of empty or blind seed removal. If desired, further refinement of the fourth and fifth position separates could possibly be effected by again processing these separates.

Further results from average weight-per-bushel (Winchester) determinations of the gravity table separates are as follows:

Gravity table separate: ^{1/}	<u>Weight per bushel</u> (pounds)
1	47.3
2	43.0
3	39.7
4	36.4
5	32.3
6	25.0

^{1/} L.S.D. to compare separate means at the 0.05 level is 1.6.

These data when combined with those given for sound seed by gravity table separates have meaningful implications on storage and sowing problems and results (table 1). For example, they show, for this seed lot, that through the elimination of seed collected at position 6 alone, a reduction of approximately 11 and 18 percent, respectively, is made in the weight and volume of seed requiring storage. Nonassessable is the value of this removal in lots used for nursery sowings or direct seeding.

This further processing of seed is not lengthy or laborious, the entire 1140 pound lot being processed in less than 30 minutes. In view of the above cited data, the process appears to warrant adoption by the tree seed extractories.

Table 1. The relationship of gravity table separates to the weight and volume of the original seed lot

Gravity table separate	<u>Weight</u>		<u>Bushels</u>	
	Pounds	Percent	Number	Percent
1	144	32.8	3.1	27.7
2	134	30.5	3.0	26.8
3	53	12.0	1.3	11.6
4	27	6.1	0.8	7.1
5	33	7.5	1.0	8.9
6	49	11.1	2.0	17.9
Total	440	100.0	11.2	100.0